



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

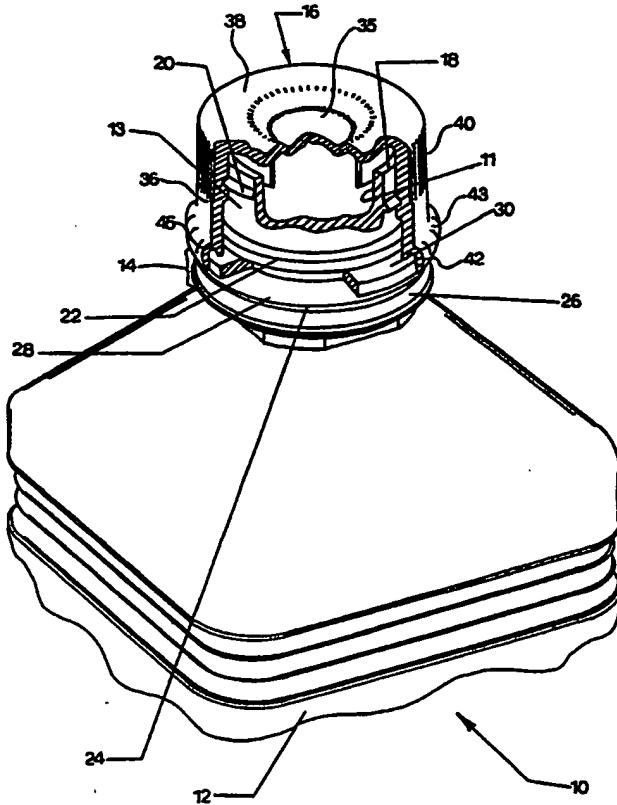
(51) International Patent Classification 5 :	A1	(11) International Publication Number:	WO 91/06484
B65D 41/04		(43) International Publication Date:	16 May 1991 (16.05.91)

(21) International Application Number:	PCT/US90/06300	(81) Designated States: AT (European patent), AU, BE (European patent), CA, CH (European patent), DE (European patent), DK (European patent), ES (European patent), FR (European patent), GB (European patent), GR (European patent), IT (European patent), LU (European patent), NL (European patent), NO, SE (European patent).
(22) International Filing Date:	30 October 1990 (30.10.90)	
(30) Priority data:		
431,001	2 November 1989 (02.11.89) US	
(71) Applicant:	BAXTER INTERNATIONAL INC. [US/US]; One Baxter Parkway, Deerfield, IL 60015 (US).	Published <i>With international search report.</i>
(72) Inventors:	FINLEY, Michael, J. ; 3421 Michael, Park City, 60085 (US). FOWLES, Thomas, A. ; 1415 Terrace, McHenry, IL 60050 (US).	
(74) Agents:	SCHAAFSMA, Paul, E. et al.; One Baxter Parkway, Deerfield, IL 60015 (US).	

## (54) Title: CONTAINER HAVING IMPROVED CLOSURE

## (57) Abstract

A closure for a container having a neck portion (14) is provided, the closure including a gasket (30) on a shoulder portion (24) of the neck (14) against which an inner contact ring (45) formed on a lower rim (43) of a closure cap (16) seals. The closure cap (16) includes a sealing lip (50) extending downwardly from a top wall (38) which sealing lip (50) forms a seal against an interior surface (11) of the neck portion (14). An outer ring member (42) which extends downwardly from the lower rim (43) of the closure cap (16) a distance greater than the inner contact ring (45) and which is adapted to surround the gasket (30) can also be provided.



**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	ES	Spain	MG	Madagascar
AU	Australia	FI	Finland	ML	Mali
BB	Barbados	FR	France	MR	Mauritania
BE	Belgium	GA	Gabon	MW	Malawi
BF	Burkina Faso	GB	United Kingdom	NL	Netherlands
BG	Bulgaria	GR	Greece	NO	Norway
BJ	Benin	HU	Hungary	PL	Poland
BR	Brazil	IT	Italy	RO	Romania
CA	Canada	JP	Japan	SD	Sudan
CF	Central African Republic	KP	Democratic People's Republic of Korea	SE	Sweden
CG	Congo	KR	Republic of Korea	SN	Senegal
CH	Switzerland	LI	Liechtenstein	SU	Soviet Union
CI	Côte d'Ivoire	LK	Sri Lanka	TD	Chad
CM	Cameroon	LU	Luxembourg	TC	Togo
DE	Germany	MC	Monaco	US	United States of America
DK	Denmark				

-1-

CONTAINER HAVING IMPROVED CLOSURE

TECHNICAL FIELD OF THE INVENTION

5       The present invention relates to containers in general and to sealing closures for containers in particular.

BACKGROUND OF THE INVENTION

Many medical liquids, such as sterile water, saline  
10 solution, electrolyte solution and the like, are packaged in containers which dispense the liquid by simply pouring out the contents, as opposed to, for example, intravenous administration. Such pour-type dispensers are typically referred to as pour bottles. Such pour-type dispensing of  
15 medical liquids is utilized, for example, in operating rooms or for emergency site wound irrigation and the like.

In the art, plastic bottles have been utilized as a low cost container for such pour-type dispensing. Such bottles typically include a body portion in which the contents are  
20 stored and a neck portion which threadingly secures a screw-cap type closure. Such bottles provide convenient access to the contents by simply removing the cap, usually in a counterclockwise rotation to open the bottle and pour.

In the medical industry, the contents of the bottle must  
25 be provided sterile and stored isolated from possible airborne contaminants such as bacteria. To this end, the bottle closures are provided sealed against the outside environment. In the art, this seal is provided by addition of a gasket between the lower rim of the closure cap and a rim provided on  
30 the neck of the bottle. An additional seal can also be provided by providing a gasket in the interior surface of the top of the closure cap to seal against the upper or pouring lip of the neck of the bottle.

While this dual seal provides satisfactory environmental isolation against contamination of the contents of the bottle, such a dual seal requires maintenance of exacting tolerances in the production of the bottles, use of expensive gasket materials, and added steps in production to install the two gaskets. While these drawbacks can be avoided by providing only a single seal under the cap, a single seal does not provide the environmental isolation that the dual seal provides. What would thus be advantageous would be to devise a dual seal type of closure assembly which avoids the drawbacks of the prior art devices.

#### SUMMARY OF THE INVENTION

The present invention provides a container having an improved closure which avoids the drawbacks of prior art. The container includes a body portion, a neck portion and a closure cap. The closure cap includes a side wall and a top wall. The neck portion of the container includes a shelf member on which a gasket rests. The gasket seals between the upper portion of the shelf member and the closure cap side wall lower rim.

Extending downwardly from the top wall of the closure cap is a conical sealing lip. The conical sealing lip contacts and seals against the neck portion's inner surface. The conical sealing lip is preferably tapered to facilitate the sealing. In addition, the inner surface of the neck portion is also preferably tapered or stepped to further facilitate sealing.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of a container made in accordance with the principles of the present invention;

Figure 2 is a partially cut-away, side elevational view of the closure of the container of Figure 1;

Figure 3 is a cut-away view of the device of Figure 1 taken along the line III-III of Figure 1; and

Figure 4 is a cut-away view of an alternative closure made in accordance with the principles of the present invention.

5

#### DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Referring to Figure 1, a container made in accordance with the principles of the present invention is seen. This embodiment is a one-piece, hermetically sealed plastic 10 container 10 having a body portion 12 and a neck portion 14. A closure cap 16 is provided as a separate attachable element. The container 10 contents are stored in the body portion 12. The body portion 12 narrows at its upper periphery to form neck portion 14. Closure cap 16 and neck portion 14 each provide 15 cooperating threaded members so that closure cap 16 can be threadedly connected to neck portion 14.

The container of the present invention can be made of any material suitable for storage of medical fluids. Such material is preferably drug compatible and autoclavable. In the 20 preferred embodiment the material is a rigid plastic material that is capable of blow molding or injection molding such as polyethylene or polypropylene. Additionally, while the container 10 and closure cap 16 can be made of different materials, such as, for example, a glass container and plastic 25 closure cap, the container 10 and closure cap 16 are preferably formed of the same material.

Referring to Figure 2, the neck portion 14 of the device of Figure 1 is seen in detail. The body portion 12 narrows into and forms a cylindrical neck portion 14 having an interior 30 surface 11 and an exterior surface 13. The terminal end of the neck portion 14 defines a pouring lip 18. Contained on the exterior surface 13 of the neck portion 14 is a threaded portion which has a standard thread 20 formed to permit

clockwise tightening of the closure cap 16. Below the threaded portion is an expanded diameter flange 22 which enhances structural integrity and retains a gasket 30 in place.

Below the expanded diameter flange 22 is a radially outwardly extending shoulder portion 24 which includes an optional circumferential groove 26 defined therein. The circumferential groove 26 reduces the amount of material needed in forming the container without substantially sacrificing structural integrity. In addition, the circumferential groove 26 can be utilized to support the container 10 by a correspondingly designed support.

The outwardly extending shoulder portion 24 includes at its upper periphery a generally flat shelf member 28 which extends generally perpendicularly from the longitudinal axis of neck portion 14. Resting on shelf member 28 is gasket 30 which acts in cooperation with closure cap 16 to form a seal, as will be discussed in detail below. Gasket 30 is preferably made of a material which has good sealing qualities such as silicone rubber or the like.

Referring now to Figure 3, the detail of the closure cap 16 of the device of Figure 1 is seen. The closure cap 16 includes a continuous cylindrical side wall 36 having an interior surface 39, an exterior surface 40 and a lower rim 43. A top wall 38 is also provided joined to the side wall 36 to form a cap-like structure. The presently described embodiment includes at the center of the top wall 38 an interiorly extending dimple 35. The side wall 36 outer surface 40 is buckled or knurled to help the user in gripping the closure cap 16 (as best seen in FIGURE 2). The side wall 36 inner surface 39 includes a threaded portion which has a cooperating standard thread 41 to engage the thread 20 of the neck portion 14.

As previously discussed, the gasket 30 is contained on the shelf member 28 of shoulder portion 24 of neck portion 14. The gasket 30 seals against shelf member 28 and the closure cap 16 lower rim 43 when the closure cap 16 is secured on the container 10.

To this end, the lower rim 43 of the closure cap 16 includes an inner contact ring 45 which presses against gasket 30 to form a first seal. The lower rim 43 further includes an outer ring member 42 which extends downwardly a distance greater than the inner contact ring 45 and has an inner diameter larger than the gasket 30. When the inner contact ring 45 contacts the resilient gasket 30 and presses against the resilient gasket 30, the resilient gasket 30 deforms in a horizontal as well as vertical direction. This horizontal deformation causes the resilient gasket 30 to press against the exterior surface 13 of the neck portion 14 and the outer ring member 42 to retain gasket 30 in place below inner contact ring 45 and to further enhance the seal provided by gasket 30 against the outside environment.

To provide still further isolation from the outside environment, a second seal is provided. To this end, an internally extending hollow conical sealing lip 50 having an exterior surface 52 and an interior surface 54 is provided which seals against the inner surface 11 of neck portion 14. The internally extending hollow conical sealing member 50 is integrally formed with the closure cap 16.

The exterior surface 52 of sealing lip 50 is the contact surface which forms a seal against the interior surface 13 of neck portion 14. To facilitate this sealing contact, the contact surface 52 of the sealing lip 50 is tapered inwardly. As a result of this taper, as the closure cap 16 is tightened on the neck portion 14 by the threads 20 and 41, the sealing lip 50 comes into contact with the interior surface 11 of neck

portion 14. In the preferred embodiment, the sealing lip 50 comes into contact with the inner surface 11 of neck portion 14 just as contact ring 45 comes into contact with gasket 30. As the closure cap 16 is tightened, contact ring 45 tightens into 5 gasket 30 while the taper on the sealing lip contact surface 52 compresses the sealing lip 50 against the inner surface 11 of the neck portion 14.

In a preferred embodiment, the inner surface 11 of neck portion 14 is also tapered to further facilitate sealing. In 10 the preferred embodiment, the taper on the sealing lip contact surface 52 is greater than the taper on the inner surface 11 of the neck portion 14. The degree of taper of the contact surface is preferably within 20% of 0.05"/in/side.

Referring now to Figure 4, an alternative closure made in 15 accordance with the principles of the present invention is seen. In this preferred embodiment, like elements are designated by reference numerals in the one hundred series of the elements in the preceding FIGURE 3. In addition, in this alternative embodiment, outwardly extending shoulder portion 20 124 is solid.

In the alternative preferred embodiment, while the contact surface 152 of sealing lip 150 is tapered, the inner surface 111 of neck portion 114 is not. Rather, the inner surface 111 of neck portion 114 includes a reduced diameter portion 58. 25 Provided between the inner surface 111 and the reduced diameter portion 58 is a conical step 60. The diameters of the inner surface 111 and reduced diameter portion 58 are provided such that the sealing lip always is in contact with one of the surfaces. This alternative embodiment is particularly suited 30 when manufacturing processes and materials utilized in forming the container 110 result in large tolerances on the inner surface 111 of the neck portion 114.

-7-

It should be understood that various changes and modifications to the preferred embodiments described herein will be apparent to those skilled in the art. Such changes and modifications can be made without departing from the spirit and scope of the present invention and without diminishing its attendant advantages. It is therefore intended that such changes and modifications be covered by the appended claims.

10

15

20

25

30

-8-

WHAT IS CLAIMED IS

1. A closure for a container having a neck portion which defines an interior surface and an exterior surface, the terminal end of the neck portion defining a pour lip, the neck portion having a shoulder portion extending radially outwardly and a threaded portion disposed above the shoulder portion, the closure comprising:
  - 5 a closure cap having a top wall and a side wall depending downwardly from the top wall, the side wall having an interior threaded surface which cooperates with the threaded portion of the neck portion of the container, the side wall defining at a lower periphery a lower rim;
  - 10 a resilient gasket overlying the shoulder portion of the container, the resilient gasket being disposed to underlie the lower rim of the closure cap such that downward axial movement of the closure cap will provide a vertical compression force by the lower rim against the resilient gasket; and
  - 15 a sealing lip extending downwardly from the closure cap top wall, the sealing lip being adapted to contact against the interior surface of the neck portion to form a seal as the closure cap is axially moved.
2. The closure of claim 1 wherein the sealing lip is inwardly tapered to facilitate sealing with the interior surface of the neck portion.
- 25 3. The closure of claim 1 wherein the interior surface of the neck portion is outwardly tapered to facilitate sealing with the sealing lip.
- 30

-9-

4. The closure of claim 1 wherein the interior surface of the neck portion is stepped to facilitate sealing with the sealing lip.
5. The closure system of claim 1 wherein the container is a medical container and the container, closure cap, and resilient gaskets are formed of drug compatible autoclavable material.
6. The closure system of claim 5 wherein the resilient gasket 10 is made of silicone rubber.
7. The closure system of claim 1 further including a flange extending radially outwardly from the exterior surface of the neck portion of the container, the flange being between the 15 threaded portion and the shoulder portion, the gasket being interposed between the shoulder portion and the flange.
8. The closure system of claim 1 wherein the lower rim of the side wall of the closure cap further comprises an inner contact 20 ring and an outer ring member, the outer ring member extending downwardly a distance greater than the contact ring and having an inner diameter which is adapted to surround the gasket so that when downward axial movement of the closure cap causes the contact ring to vertically compress the gasket, a resultant 25 horizontal expansion of the gasket will cause the gasket to press against both the outer ring member and the exterior surface of the neck portion.

-10-

9. A closure cap for use with a container having a neck defining an interior and exterior surface, the neck having a shoulder portion extending radially outwardly and being adapted for supporting a gasket, the neck further having a threaded portion on the exterior surface above the shoulder portion, the closure cap comprising:
  - a top wall and a side wall depending downwardly from the top wall, the side wall having an interior threaded surface which cooperates with the threaded portion of the neck,
  - 10 side wall defining at a lower periphery a lower rim which forms a seal against the gasket on the shoulder portion as the closure cap is axially engaged on the neck, the top wall including a sealing lip extending downwardly within the side wall, the sealing lip being adapted to seal against the
  - 15 interior surface of the neck as the closure cap engages the neck.
10. The closure cap of claim 9 wherein the sealing lip is inwardly tapered to facilitate sealing with the interior surface of the neck portion.
11. The closure cap of claim 9 wherein the sealing lip is integrally formed with the top wall.
- 25 12. The closure cap of claim 9 wherein the lower rim of the side wall of the closure cap further comprises an inner contact ring which contacts the gasket and an outer ring member which extends downwardly a distance greater than the contact ring and has an inner diameter which is adapted to surround the gasket
- 30 so that when downward axial movement of the closure cap causes the contact ring to vertically compress the gasket, a resultant horizontal expansion of the gasket will cause the gasket to press against both the outer ring member and the exterior surface of the neck portion.

-11-

13. A closure for a container having a neck portion the terminal end of which defines a pour lip, the neck portion having a shoulder portion extending radially outwardly and a threaded portion disposed above the shoulder portion, the

5 closure comprising:

a closure cap having a top wall and a side wall depending downwardly from the top wall, the side wall having an interior threaded portion which cooperates with the threaded portion of the neck portion of the container;

10 and a resilient gasket overlying the shoulder portion of the container;

the side wall further defining at a lower periphery a lower rim, the lower rim including an inner ring and an outer ring member, the outer ring member extending downwardly a

15 distance greater than the contact ring and having an inner diameter which is adapted to surround the gasket so that when downward axial movement of the closure cap causes the contact ring to vertically compress the gasket, a resultant horizontal expansion of the gasket will cause the gasket to press against

20 both the outer ring member and the exterior surface of the neck portion.

14. The closure of claim 13 further including a sealing lip extending downwardly from the closure cap top wall, the sealing

25 lip being adapted to contact against an interior surface of the neck portion to form a seal as the closure cap is axially moved.

1 / 3

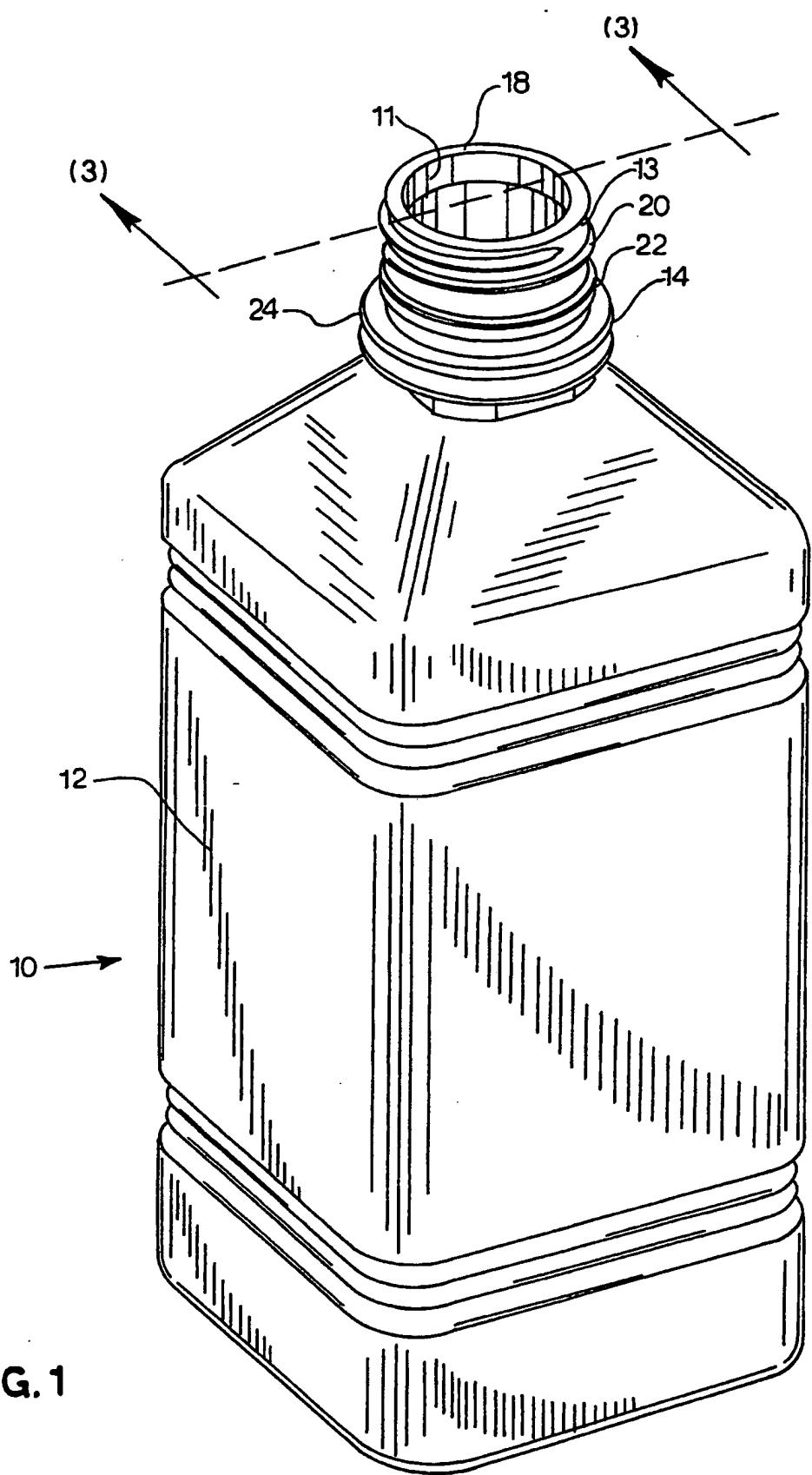


FIG. 1

2 / 3

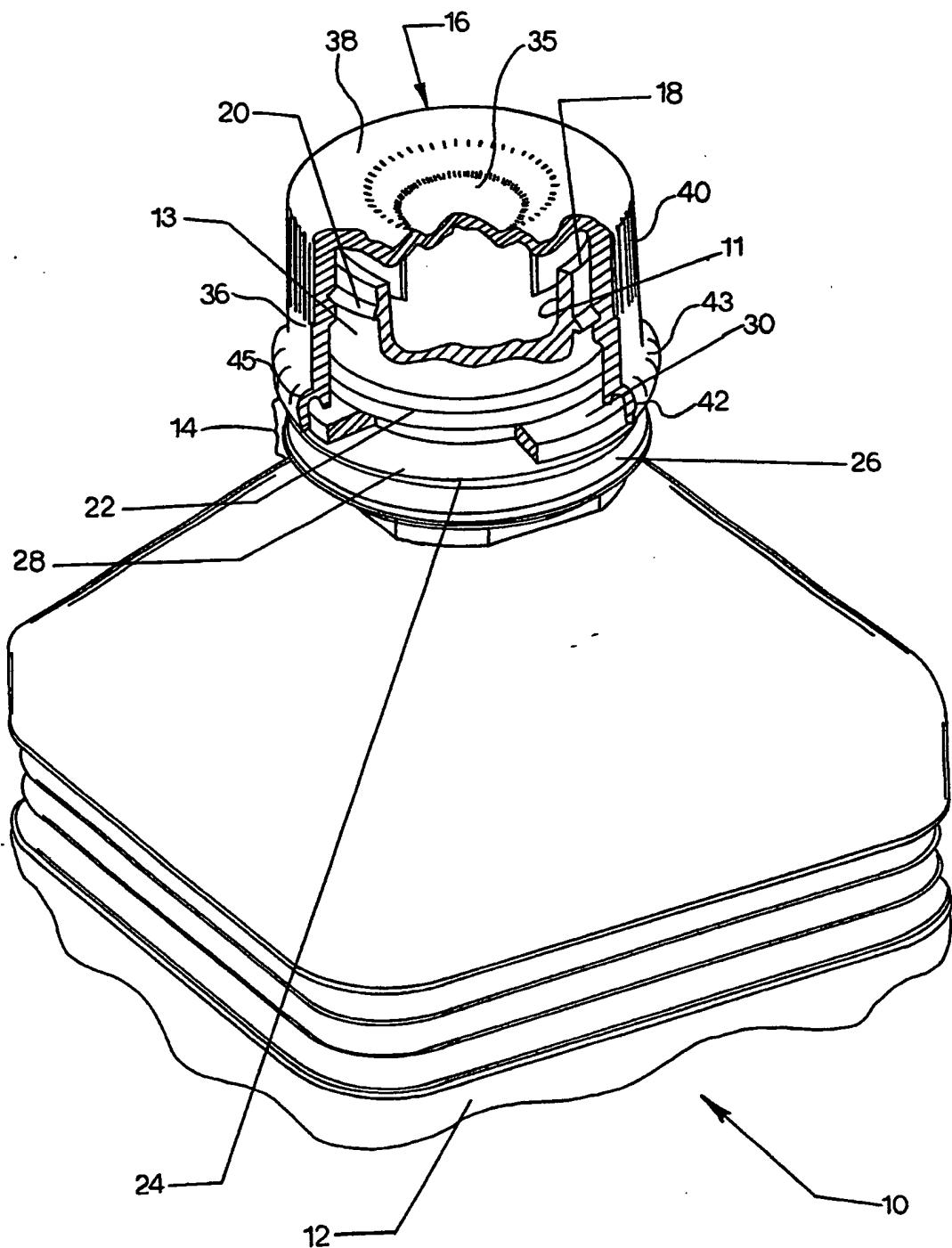
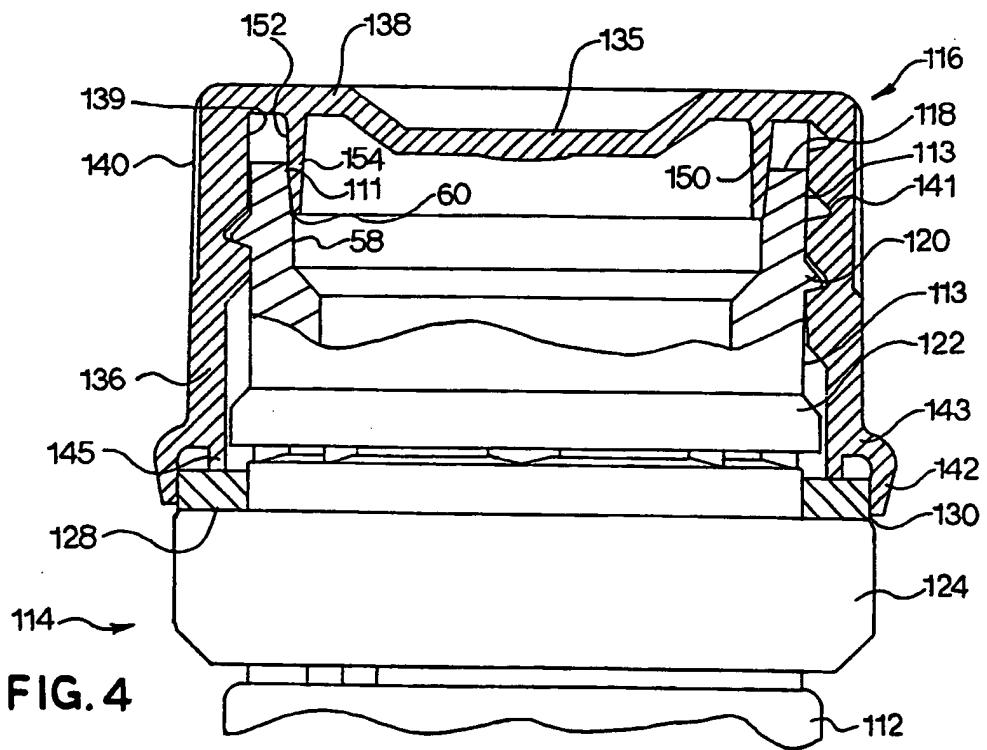
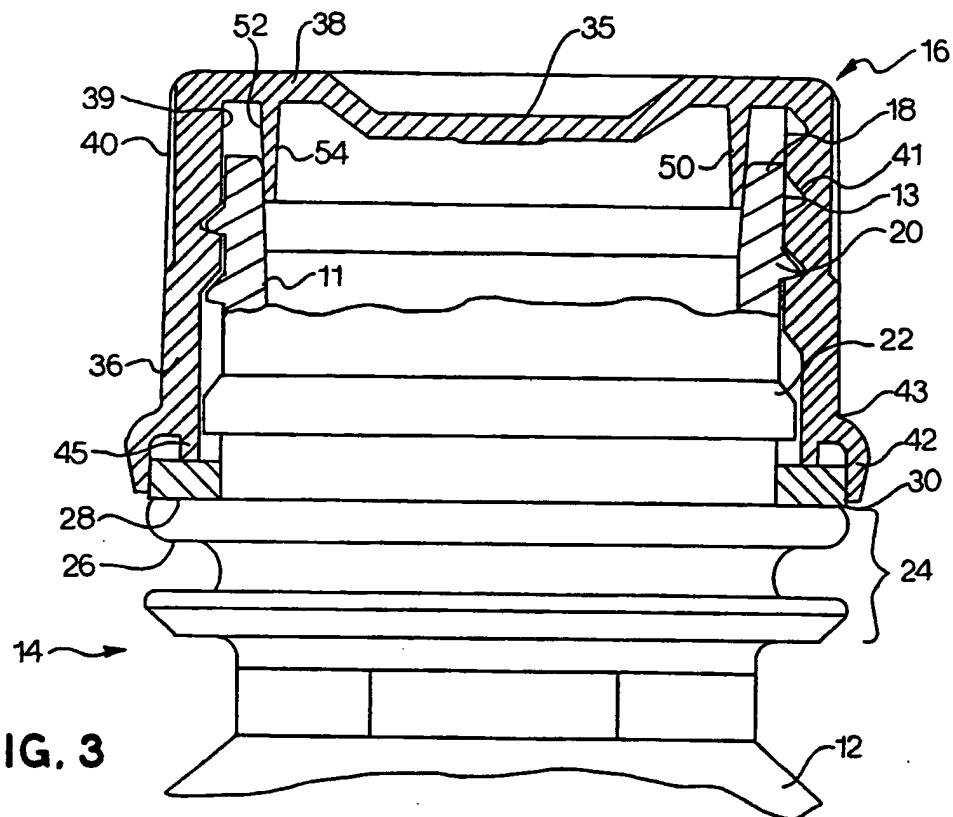


FIG. 2

3 / 3



# INTERNATIONAL SEARCH REPORT

International Application No PCT/US90/06300

## I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) <sup>3</sup>

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC (5) : B65D 41/04

U.S. Cl : 215/329

## II. FIELDS SEARCHED

Minimum Documentation Searched <sup>4</sup>

Classification System	Classification Symbols
U.S.	215/329, 341, 344, 352, Dig. 1; 220/304

Documentation Searched other than Minimum Documentation  
to the Extent that such Documents are Included in the Fields Searched <sup>5</sup>

## III. DOCUMENTS CONSIDERED TO BE RELEVANT <sup>14</sup>

Category <sup>15</sup>	Citation of Document, <sup>16</sup> with indication, where appropriate, of the relevant passages <sup>17</sup>	Relevant to Claim No. <sup>18</sup>
Y	US,A 4,712,699 (LUTZ) 15 December 1987 Note Figure 2 and Column 3, Lines 41-45.	1-14
Y	US,A 198,528 (WOODWARD) 25 December 1877 Note Figure 4 and Column 2, Lines 3-12.	1-14
Y	US,A 4,177,905 (WINCHELL ET AL) 11 December 1979 Note Figure 2 and Column 2, Lines 42-46.	7
A	US,A 4,418,833 (LANDIS) 06 December 1983	

\* Special categories of cited documents: <sup>15</sup>

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

## IV. CERTIFICATION

Date of the Actual Completion of the International Search <sup>19</sup>

05 DECEMBER 1990

International Searching Authority <sup>1</sup>

TSA/US

Date of Mailing of this International Search Report <sup>20</sup>

05 FEB 1991

Signature of Authorized Officer <sup>20</sup>

*Stephen Garbe*  
STEPHEN GARBE

DERWENT- 1991-164075

ACC-NO:

DERWENT- 199847

WEEK:

COPYRIGHT 2005 DERWENT INFORMATION LTD

TITLE: Double seal container - has cap with skirt engaging resilient gasket on container neck and also sealing lip engaging inside container neck

INVENTOR: FINLEY, M J; FOWLES, T A

PATENT-ASSIGNEE: BAXTER INT INC [BAXT]

PRIORITY-DATA: 1989US-0431001 (November 2, 1989)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
WO 9106484 A	May 16, 1991	N/A	017	N/A
NO 304017 B1	October 12, 1998	N/A	000	B65D 041/04
AU 9067252 A	May 31, 1991	N/A	000	N/A
EP 451257 A	October 16, 1991	N/A	000	N/A
NO 9102579 A	July 1, 1991	N/A	000	N/A
NZ 235922 A	June 25, 1993	N/A	000	B65D 041/04
AU 639958 B	August 12, 1993	N/A	000	B65D 041/04
EP 451257 A4	September 29, 1993	N/A	000	N/A
EP 451257 B1	November 29, 1995	E	009	B65D 041/04

DESIGNATED- AU CA NO AT BE CH DE DK ES FR GB GR IT LU NL SE BE GB SE BE GB  
STATES: SE

CITED- US 198528; US 4177905 ; US 4418833 ; US 4712699 ; GB 875529 ; US  
DOCUMENTS: 1854451

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
--------	-----------------	---------	-----------

NO 304017B1 N/A	1990WO-US06300 October 30, 1990
NO 304017B1 N/A	1991NO-0002579 July 1, 1991
NO 304017B1 Previous Publ.	NO 9102579 N/A
EP 451257A N/A	1990EP-0916959 October 30, 1990
NZ 235922A N/A	1990NZ-0235922 November 1, 1990
AU 639958B N/A	1990AU-0067252 October 30, 1990
AU 639958B Previous Publ.	AU 9067252 N/A
AU 639958B Based on	WO 9106484 N/A
EP 451257A4 N/A	1990EP-0916959 N/A
EP 451257B1 N/A	1990EP-0916959 October 30, 1990
EP 451257B1 N/A	1990WO-US06300 October 30, 1990
EP 451257B1 Based on	WO 9106484 N/A

**INT-CL (IPC) :** B65D041/04, B65D053/00 , B65D053/02

**ABSTRACTED-PUB-NO:** EP 451257B

**BASIC-ABSTRACT:**

Double-seal closure and container has a cap (16) with a depending sealing lip (50) engaging inside the interior surface of the neck portion and a lower cap rim (45) which engages with a resilient gasket (28) provided on an external shoulder (26) around the container neck. Pref. the cap rim also comprises an outer skirt portion (42) surrounding the gasket. Pref. the entire container is made of autoclavable material. The gasket is pref. made of silicone rubber. The cap can be of plastic and the container can be of plastic or glass. The plastic can be polyethylene or polypropylene.

**USE/ADVANTAGE -** Particularly for medical fluids. Does not require exacting tolerances of the cap and container as in prior art constructions.

**ABSTRACTED-PUB-NO:** WO 9106484A

**EQUIVALENT-ABSTRACTS:**

A closure cap and container combination, the container (10) having a neck portion (14), the terminal end of which defines a pour lip (18), the neck portion having a shoulder portion extending radially outwardly and a screw thread on its exterior surface (13) and disposed above the shoulder portion, the closure cap (16) having a top wall (38, 138) and a side wall depending downwardly from the top wall, the side wall having an interior screw thread which cooperates with the thread (20) of the neck portion (14) of the container (10), the side wall (36, 136) defining a lower rim at a lower periphery thereof, characterised by a resilient gasket overlying the shoulder portion of the container (10); the lower rim including an inner ring and an outer ring extending downwardly a distance greater than the inner ring, the gasket underlying the inner ring when the cap (16) is positioned on the neck portion (14) of the container, such that the inner ring axially compresses the gasket when the cap is screwed down onto the neck portion (14), the outer ring

surrounding the gasket when the inner ring contacts the gasket so that when the inner ring axially compresses the gasket, a resultant horizontal expansion of the gasket causes the gasket to press against both the outer ring and the exterior surface (13) of the neck portion (14).

**CHOSEN-** Dwg. 1/4 Dwg. 3/4

**DRAWING:**

**TITLE-TERMS:** DOUBLE SEAL CONTAINER CAP SKIRT ENGAGE RESILIENT GASKET CONTAINER NECK SEAL LIP ENGAGE CONTAINER NECK

**DERWENT-CLASS:** A92 B07 Q32 Q33

**CPI-CODES:** A12-P03; A12-V03D; B04-C03B; B11-C06;

**CHEMICAL-CODES:** Chemical Indexing M1 \*01\* Fragmentation Code B414 B713 B720 B744 B796  
B799 B833 M210 M211 M250 M283 M320 M423 M424 M430 M510 M520 M530 M540  
M620 M740 M782 M903 M904 N101 V743 Specific Compounds 08017M

Chemical Indexing M1 \*02\* Fragmentation Code H7 H721 M210 M212 M213  
M231 M320 M423 M424 M430 M510 M520 M530 M540 M610 M740 M782 M903 M904  
M910 N101 V0 V743 Specific Compounds 01841M 01846M

Chemical Indexing M1 \*03\* Fragmentation Code M423 M424 M430 M740 M782  
M903 N101 V793

Chemical Indexing M6 \*04\* Fragmentation Code M903 R720 R750 R760 R770

**UNLINKED-DERWENT-REGISTRY-NUMBERS:** ; 1841U ; 1846U

**POLYMER-MULTIPUNCH-CODES-AND-KEY-SERIALS:**

**Key Serials:** 0009 0231 0239 0248 1306 2399 2600 2607 2623 2628 3258 2746 2768 2781  
2782 2785

**Multipunch Codes:** 014 032 04- 041 046 047 05- 050 229 331 38- 381 387 402 50& 541 545  
551 560 562 566 623 625 629 643 645 651 652 653 662 688

**SECONDARY-ACC-NO:**

**CPI Secondary Accession Numbers:** C1991-070998

**Non-CPI Secondary Accession Numbers:** N1991-125743